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DEPARTMENT OF HEALTH SERVICES
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February 22, 2005

TO: Each Supervisor

FROM: Thomas L. Garthwaite, M.D.
Director and Chief Medical Officer

Jonathan E. Fielding, M.D., M.P.H.
Director of Public Health and Health Officer

SUBJECT: **FINAL REPORT ON COMMUNITY HEALTH CONCERNS AND THE SUNSHINE CANYON LANDFILL**

On September 9, 2003, the Board approved a motion by Supervisor Antonovich, instructing the Department of Health Services to attend the September 11, 2003 Los Angeles Regional Water Quality Board meeting and report back to the Board with recommendations for examining claims of cancer and other illnesses among individuals living near the Sunshine Canyon Landfill. A report was provided to the Board on October 14, 2003 describing the Department's plan for investigating the community's health concerns. The objective of the investigation was to determine if these concerns reflect a higher than expected rate or an unusual pattern of disease in the concerned community.

The investigation has now been completed and, with the possible exception of self-reported asthma and wheezing symptoms among adult females, did not find evidence of unusually high rates or unusual patterns of disease in the concerned community relative to disease rates and patterns seen countywide. The investigation did confirm that there is widespread concern about the landfill among residents in the community. The investigation included eight components, each of which is summarized below with more detailed descriptions provided in the attached reports.

1) **Analysis of cancer data by the University of Southern California Cancer Surveillance Program (CSP):** The CSP has the most complete and accurate statistics available on cancer

7) **Cancer case verification:** Some community members expressed concern that the USC CSP statistics are incomplete and do not account for the "clusters" of cancer on some of the streets near the landfill. Formal studies of the CSP have found greater than 95% completeness of reporting of cancer diagnoses. However, to address the community concerns, two streets identified by community members as having clusters of cancer were selected to assess the completeness of reporting to the CSP (see attached letter). Going door-to-door, DHS staff identified a total of 14 reportable cancers among residents on the two streets. Of these, 13 had been reported to the CSP. The single unreported case had been diagnosed recently and, therefore, would not yet be expected to be in the registry's database.

8) **Literature review:** A review of the published scientific literature revealed at least 50 studies that examined potential health risks associated with living near landfills. Nearly all of these studies focused on hazardous landfills rather than municipal landfills. Sunshine Canyon Landfill is classified as a municipal landfill. Some studies found increased rates of low birth weight births, birth defects, and some types of cancer associated with residence near hazardous landfills. Other studies, however, found no such associations. We were unable to find any studies that linked adverse health effects with residence near municipal landfills.

In summary, with the possible exception of self-reported asthma and wheezing symptoms among women, our investigation did not find evidence of unusually high rates or unusual patterns of disease among residents living in census tracts near the Sunshine Canyon Landfill. A community meeting is currently being scheduled to disseminate the results of the investigation and to answer questions.

If you have questions or need additional information, please let either of us know.

TLG:JEF:nb
309:013/s

Attachments

c: Chief Administrative Officer
Executive Officer, Board of Supervisors
County Counsel
James Stratton, MD, MPH, California Environmental Protection Agency
Jonathan Bishop, Executive Officer, California Regional Water Quality Control Board

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
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October 14, 2003

TO: Each Supervisor

FROM: Thomas L. Garthwaite, M.D.
Director and Chief Medical Officer

Jonathan E. Fielding, M.D., M.P.H.
Director of Public Health and Health Officer

SUBJECT: **COMMUNITY HEALTH CONCERNS AND SUNSHINE CANYON LANDFILL**

This is in response to the September 9, 2003 Board motion instructing the Department of Health Services to attend the September 11, 2003 Los Angeles Regional Water Quality Board meeting and report back to the Board with recommendations for examining claims of cancer and other illnesses among individuals living near the Sunshine Canyon Landfill. Dr. Paul Simon, Director of Health Assessment and Epidemiology, attended the Water Quality Board meeting. He and staff in the Toxics Epidemiology Program have reviewed background materials related to the landfill and associated health complaints. They also convened a meeting with approximately 20 community representatives on September 30th to obtain additional information on the health concerns and to begin discussions on possible approaches for investigating these concerns. During this process, they have worked closely with Dr. James Stratton, of the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA), who was asked by the Water Quality Board to provide consultation on these community health concerns.

Based on the information collected to date, the following actions are recommended and have been initiated:

1) **Request additional analysis of data from the University of Southern California Cancer Surveillance Program (CSP):** State law mandates that all cancers (except non-melanotic skin cancers) diagnosed in California residents be reported to the California Cancer Registry (CCR). The USC CSP, which is the Region of the CCR serving Los Angeles County, has collected statistics on cancers diagnosed in the county population since 1972. The CSP is funded by the National Cancer Institute and the California Department of Health Services,

and adheres to rigorous quality control standards to ensure accurate and complete reporting of all cases. The CSP has conducted two prior analyses of cancer rates in the area just east of the Sunshine Canyon Landfill and neither has shown an excess of cancer. We have asked that they conduct additional analysis of cancer rates in the adjacent census tracts extending to the south of the landfill. We have been told that they will provide a completed report in the next two weeks.

2) **Analysis of low birth weight births:** Because of community concerns expressed about possible adverse birth outcomes, we analyzed data from birth certificates on all births in 1995-2000 among women residing in the nine census tracts closest to the landfill. These data are required by state law to be reported on all live births. The results indicate that the rates of low birth weight births in the nine census tracts during the 6-year period were similar to the rate reported countywide.

3) **Analysis of data from the California Birth Defects Monitoring Program:** This program collects data on all infants born with selected birth defects in the state. In Los Angeles County, data are collected on five conditions: Down Syndrome, cleft lip with or without cleft palate, neural tube defects (e.g., spina bifida), and two congenital heart defects (transposition of the great arteries and Tetralogy of Fallot). To further address community concerns about possible adverse birth outcomes, we asked the state's Birth Defects Monitoring Program to compare the rates of these five conditions in the two zip code areas (they do not have data by census tract) nearest the landfill with the rates seen countywide. We have been told they will issue their report in the next two weeks.

4) **Analysis of death rates and causes of death:** State law requires that death certificates be filed on all deaths and include information on age at death and causes of death. We are currently analyzing death certificate data for the period 1996-2001 to determine age-adjusted death rates and causes of deaths in the nine census tracts around the landfill and to compare these results with statistics for the population countywide. We expect the analysis to be completed in the next week.

5) **Analysis of childhood asthma:** To address community concerns about respiratory illness, we will attempt to assess the prevalence of childhood asthma in the neighborhoods adjacent to the landfill compared to the prevalence countywide (available from the Los Angeles County Health Survey). We are exploring two possible strategies to collect the needed data for children residing near the landfill. First, we have scheduled a meeting with the principal of the elementary school closest to the landfill to determine if we can access the school health records of incoming kindergartners over the past several years to determine the percentage with a history of asthma. Second, we are planning a targeted household survey (see below).

6) **Household survey:** A number of community members expressed concern that the official cancer statistics from USC do not accurately reflect what is occurring in their community for at least two reasons. First, some cancers may have occurred that have not yet been reported to the registry and, second, some long-time residents (especially children who grew up in the area) may have moved away prior to being diagnosed with cancer. These persons would not be included in the USC CSP statistics for the area adjacent to the landfill because cancer cases are counted based on the address at the time of diagnosis. We will do a targeted door-to-door survey of a random sample of households in the census tract closest to the landfill to

determine if there have been cases of unreported cancer or children who moved away and were then diagnosed with cancer as adults. The survey will also include questions about asthma and other chronic respiratory conditions. The number of households sampled will be determined by statistical power calculations and by available resources although we estimate the number will be in the range of 100 households.

7. **Additional cancer casefinding:** Because there are many more households in the census tract closest to the landfill than will be included in the survey, we will also offer concerned residents in this census tract an opportunity to voluntarily submit cancer reports using a standardized reporting form to identify additional cases among current residents and those who grew up in the neighborhood and then moved away. If unreported cases are identified among current residents, this information will be used to update the USC CSP analysis. Cases identified among former child residents who moved away cannot be used to calculate cancer rates because we do not have information on all persons who lived in the census tract in the past. However, the cancer reports can be reviewed to determine if there are uncommon cancers occurring that have been shown in the published peer-reviewed scientific literature to be linked to environmental causes.

8. **Literature review:** We have begun a review of the research literature on the relationship between landfills and the health of nearby residents. We will provide a written summary of this review in the next month.

It is important to note that the data analyses described above will provide information on the rates and patterns of specific health conditions and overall mortality in the community near the landfill compared to the rest of the county. However, the analyses will not be able to assess cause and effect relationships between the landfill and health conditions. For example, if we find a higher prevalence of childhood asthma in the community than among children countywide, this disparity could be due to known triggers of asthma (e.g., pollen, animal dander, cigarette smoke, and ambient air pollution) rather than factors associated with the landfill. In addition, the tools of epidemiology as described above are generally not sensitive enough to detect adverse health effects, even when there is evidence of toxic exposures, unless the exposures are at much higher levels (as for example, in a hazardous work setting) than would be plausibly expected in a community setting.

We will provide you with information on the results of our investigation as they become available. If you have questions, please contact either of us or Dr. Paul Simon at (213) 240-7785.

TLG:JEF:ps
309:013

c. Chief Administrative Officer
County Counsel
Executive Officer, Board of Supervisors
James Stratton, MD
Wendy Cozen, DO
Dennis Dickerson

USC

UNIVERSITY OF SOUTHERN CALIFORNIA

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Department of Preventive Medicine
USC Cancer Surveillance Program

Community Cancer Assessment on the Sunshine Canyon Landfill Area

Final Report: October 18, 2003

Report prepared by Wendy Cozen, D.O., M.P.H.
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The University of Southern California Cancer Surveillance Program (USC-CSP) is the population-based cancer registry for Los Angeles County that was begun in 1972. By law, all cancers diagnosed in California since January 1, 1988 are reported to one of the regional registries that form the California Cancer Registry (CCR), the legally mandated cancer reporting system of California. The USC-CSP serves as Region 9 of the CCR, and is also one of the registries participating in the National Cancer Institute's Surveillance, Epidemiology and End-Results Program. Cancer surveillance in the USC-CSP is funded by the California Department of Health Services, the Centers for Disease Control and Prevention, and the National Cancer Institute. Data is collected on all new cancer patients diagnosed in Los Angeles County since 1972 and includes information on age, race/ethnicity, address at diagnosis, gender and specific type of cancer. All invasive cancers, excluding non-melanoma skin cancers, are reported, along with in situ breast and bladder cancer, and benign brain tumors. Completeness of the reporting to the registry is estimated at over 95%.

This report is in response to a request by Paul Simon, M.D. of the Los Angeles County Department of Health Services and James Stratton, M.D. of the California Environmental Protection Agency, for an assessment of the cancer risk in the neighborhoods near the Sunshine Canyon Landfill.
We evaluated the risk of specific cancers among the residents of the census tract containing the landfill (1066.03) and of the census tracts surrounding the landfill (1065.00, 1066.01, 1066.02, 1066.41, 1066.42, 1066.43), by comparing the observed number of cases residing in each area to that expected based on Los Angeles County-

wide incidence rates, adjusted for age and standardized to the population age distribution of the 2000 U.S. Census. If the expected or observed number of cancers in the census tract for any given comparison is 10 or less, the analysis was suppressed, since results would be difficult to interpret. In the attached tables we report the observed number, the 95% confidence interval around the expected number, and the relative risk (risk in one of the two sets of census tracts listed above), compared to elsewhere in Los Angeles, if the relative risk was greater than 1.5 and the p value was less than 0.05. We use these cut-off points because they are epidemiological standards when interpreting possible causal associations. We assessed the neighborhood risks of lung, liver, bladder, and colon cancer because these would be most likely to result from a carcinogenic exposure in air or water. We also evaluated the risks of all types of cancer in all ages and in children up to 14 years old, and of breast cancer (invasive only, excluding in situ), in response to specific requests.

Results:
Because the population of the census tract containing the Sunshine Canyon Landfill is small, we could only evaluate the risk of all cancers considered together and of breast cancer among women and there were no observed excesses of these types of cancers (Tables 1 and 3). Fewer than 10 of each other type of cancer occurred among these residents over the 27-year period. Similarly, in the neighborhoods around the Sunshine Canyon Landfill, there were no excesses observed in any type of cancer that we evaluated (Tables 2 and 4). All were within the expected range except for two- the observed number of male lung cancers in the surrounding tracts and the observed number of all male cancers combined in the census tract containing the Sunshine Canyon Landfill, were actually less than expected.
Additional comparisons within socioeconomic class strata, (i.e. comparing the incidence rates to those of similar socioeconomic class in Los Angeles County as a whole), showed no excess occurrence of cancers in these census tracts.

These results provide evidence that proximity to the Sunshine Canyon Landfill has not resulted in a measurable excess of lung, liver, breast, colon, bladder, childhood or all types of cancers in all ages combined. This does not mean that an individual case of cancer could not have resulted from the landfill, only that no excess could be detected. This type of neighborhood analysis has some limitations. It is possible that residents moved out of this Granada Hills area and were diagnosed with cancer while living in other areas, and that persons now residing in these census tracts were diagnosed with cancer after living here for a short time. This type of bias is most important for people diagnosed with cancer as young adults, but it does not seem to be a serious problem for evaluation of cancers in children under 18 or adults over 40 years of age (i.e. less than 10% of people in these age groups move every 5-10 years, according to the U.S. Census Bureau), and the majority of cancers occur among adults over 40 years of age.

It should be noted that there have been several studies of cancer risk around other dumpsites in Los Angeles County and no cancer excess has been identified near any of these. This is partly because over a long time period, cancers become relatively common among residents in any neighborhood and about 1/3 of us will eventually develop at least

one cancer. In addition, since genetics and lifestyle factors such as smoking, diet and hormone use play such a strong role in causing cancers, it may be difficult to detect other weaker associations. Thus, studies of health impact should also focus on measuring potentially toxic or carcinogenic exposures, and evidence of such exposures should be used in making public policy, regardless of whether an excess of cancers around the source of concern can be identified.

Analysis of risk of cancers in the Sunshine Canyon landfill area

Table 1. Expected and observed numbers of cancers in males, residing in census tract 1066.03 from 1972-1999, USC Cancer Surveillance Program, adjusted for age.

Type of Cancers	No. Expected[1]/100,000	No. Observed	No. Excess Cases	Relative Risk[2]
All cancers	61-97	46	0	NS[2]
Lung	-	<10	-	-
Colon	-	<10	-	-
Bladder	-	<10	-	-
Liver	-	< 10	-	-
Childhood	-	< 10	-	-

[1] 95% confidence intervals around the expected number of cancers, based on the gender/age specific incidence of that cancer in Los Angeles County applied to the specific population.
[2] NS= Not significant (relative risk less than 1.5 or $p > 0.05$).

Table 2. Expected and observed numbers of cancers in males, residing in census tracts 1065.00, 1066.01.1066.02, 1066.41, 1066.42, 1066.43 from 1972-1999, USC Cancer Surveillance Program, adjusted for age.

Type of Cancers	No. Expected[1]/100,000	No. Observed	No. Excess Cases	Relative Risk[2]
All cancers	765-878	782	0	NS[2]
Lung	162-217	158	0	NS[2]
Colon	56-91	82	0	NS[2]
Bladder	27-52	36	0	NS[2]
Liver	5-20	13	0	NS[2]
Childhood	5-20	12	0	NS[2]

[1] 95% confidence intervals around the expected number of cancers, based on the gender/age specific incidence of that cancer in Los Angeles County applied to the specific population.
[2] NS= Not significant (relative risk less than 1.5 or $p > 0.05$).

Table 3. Expected and observed numbers of cancers in females, residing in census tract 1066.03 from 1972-1999, USC Cancer Surveillance Program, adjusted for age.

Type of Cancers	No. Expected[1]/100,000	No. Observed	No. Excess Cases	Relative Risk[2]
All cancers	56-91	65	0	NS[2]
Breast	11-29	18	0	NS[2]
Lung	-	<10	-	-
Colon	-	<10	-	-
Bladder	-	<10	-	-
Liver	-	< 10	-	-
Childhood	-	< 10	-	-

[1] 95% confidence intervals around the expected number of cancers, based on the gender/age specific incidence of that cancer in Los Angeles County applied to the specific population.
[2] NS= Not significant (relative risk less than 1.5 or $p > 0.05$).

Table 4. Expected and observed numbers of cancers in females, residing in census tracts 1065.00, 1066.01.1066.02, 1066.41, 1066.42, 1066.43 from 1972-1999, USC Cancer Surveillance Program, adjusted for age.

Type of Cancers	No. Expected[1]/100,000	No. Observed	No. Excess Cases	Relative Risk[2]
All cancers	697-806	776	0	NS[2]
Breast	167-223	220	0	NS[2]
Lung	81-122	96	0	NS[2]
Colon	54-88	68	0	NS[2]
Bladder	8-25	21	0	NS[2]
Liver	-	<10	-	-
Childhood	4-17	11	0	NS[2]

[1] 95% confidence intervals around the expected number of cancers, based on the gender/age specific incidence of that cancer in Los Angeles County applied to the specific population.
[2] NS= Not significant (relative risk less than 1.5 or $p > 0.05$).

Cc: Ronald K. Ross, M.D.; Dennis Deapen, Dr.PH.; Leslie Bernstein, Ph.D.; William Wright, Ph.D.; James Stratton, M.D.; Cyrus Rangan, M.D.; Janet Scully, M.P.H.

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Community Birth Defects Assessment on the Sunshine Canyon Landfill Area

Final Report: October 24, 2003

Report prepared by: John A. Harris, M.D., M.P.H.
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Background: At the request of the Los Angeles County, Department of Health Services and the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment, the California Birth Defects Monitoring Program (CBDMP) compared rates of specific birth defects in zip code areas close to Sunshine Canyon Landfill with rates in all of Los Angeles County. CBDMP is recognized internationally for the quality of its birth defects surveillance and research. In order to collect data on birth defects, CBDMP uses the "gold standard" for data collection: that is CBDMP staff visit 250 hospitals and genetic centers in California to identify children with structural congenital anomalies diagnosed during the first year of life.

Methodological Considerations: Epidemiological investigations are relatively conclusive when large, population-based samples are involved. Conversely, investigations like this involving local area analysis are limited by small sample sizes. The California Birth Defects Monitoring Program used all available data, but rate estimates in the zip codes under question still had wide confidence intervals. The confidence interval indicates that there is a 95% probability that the actual rate falls somewhere between the lower and the upper limit. In calculating rates for zip codes around the landfill, wide confidence intervals mean that the rate estimates are very imprecise due to the small sample sizes of pregnant women and small numbers of children born with specific birth defects.

Results: Table 1 below shows no statistically significant elevated rates in the zip code 91344 closest to the landfill compared to Los Angeles County as a whole. In other words the confidence intervals around the rate estimates for the congenital heart defects, Transposition of the Great Vessels and Tetralogy of Fallot, overlapped with the confidence intervals around the rate estimates for Los Angles County. Similarly in the other zip codes 91326 and 91342, rates were not statistically significantly higher. Also, combining data (data not shown) among all the zip codes for each of the birth defects conditions in Table 1 reveals no significant difference in rates in the combined areas close to the Sunshine Canyon landfill compared to all of Los Angeles County.

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Table 1: Birth Defects Rates with 95% confidence intervals LA County, zip code 91344 and zip codes 91326 and 91342, years 1990-2001. (Rates per 10,000 live and still births)

Condition	LA county	Zipcode:91344	Zipcode: 91326	Zipcode: 91342
Neural tube defects	5.61 (5.29-5.94)	3.01 (0.37-8.40)	6.86 (0.83-19.09)	7.21 (3.84-11.62)
Transposition of Great Vessels	2.25 (2.05-2.46)	4.52 (0.93-10.89)	0	2.22 (0.60-4.86)
Tetralogy of Fallot	3.44 (3.18-3.70)	4.52 (0.93-10.89)	3.43 (0.09-12.64)	3.33 (1.22-6.47)
Cleft lip with or without cleft palate	14.68 (14.15-15.21)	9.04 (3.32-17.58)	24.00 (9.65-44.73)	11.09 (6.78-16.45)
Down Syndrome	13.27 (12.77-13.77)	7.54 (2.45-15.43)	6.86 (0.83-19.09)	14.97 (9.87-21.12)

Discussion: Since all available data from 12 years were combined for this analysis, it is reassuring to note that there is no difference in birth defect rates among residents living in any of the zip codes close to the Sunshine Canyon Landfill compared to Los Angeles County as a whole. Furthermore, even if rates were high in the above zip codes, that would not necessary implicate exposure to the landfill. On the other hand, because of the small sample sizes in the zip codes under question and other methodological considerations, this investigation can not rule out that exposures to the Sunshine Canyon Landfill are associated with a small risk of developing birth defects among some people living nearby.

COUNTY OF LOS ANGELES
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Mortality Assessment in the Sunshine Canyon Landfill Area

Final Report: November 17, 2003

Report Prepared by: Cyrus Rangan, MD, FAAP, ACMT
Director, Toxics Epidemiology Program

The Los Angeles County Department of Health Services, Office of Public Health Assessment and Epidemiology analyzed mortality statistics in response to community concerns regarding potential adverse health effects for residents living near the Sunshine Canyon Landfill. The data for this analysis were obtained from information on registered death certificates in Los Angeles County, which is maintained in the Automated Vital Statistics System (AVSS) by the Los Angeles County Department of Health Services, Data Collection and Analysis Unit. Since registration of death certificates is required by law, the reporting of deaths to AVSS it is nearly 100 percent complete.

Methods:

The mortality analysis was performed with 1996-2001 death certificate data from each of three areas: the area closest to the Sunshine Canyon Landfill (1990 Census tract 1066.03), the adjacent Granada Hills/Sylmar area (1990 Census tracts 1065.00, 1066.01, 1066.02, 1066.41, 1066.42, 1066.43), and all of Los Angeles County combined. The leading causes of death in each area were determined by analyzing data on the listed underlying cause in the medical portion of each death certificate. "Underlying cause of death" is defined as the disease or injury initiating the sequence of events leading directly to death. Cumulative age-adjusted mortality rates were standardized to the population age distribution of the 2000 U.S. Census.

Results:

The attached table presents the seven leading causes of death in the three areas. Age-adjusted rates for the top two causes of death (heart disease and cancer) were lower in the Landfill tract than in the county overall. Stroke mortality was higher (36 per 10,000) in the Landfill tract than in the county overall (24 per 10,000). For all other causes of death, small numbers (<10 deaths) in the Landfill tract produced statistically unstable rates and, therefore, did not allow for comparison with the countywide rates. In the adjacent Granada Hills/Sylmar area, the heart disease mortality rate was higher (238 per 10,000) than in the county overall (160 per 10,000). Mortality due to emphysema and other chronic respiratory diseases was lower in the Granada Hills/Sylmar area (25 per 10,000) than in the county overall (34 per 10,000). All other cause-specific mortality rates in the Granada Hills/Sylmar area were comparable to the countywide rates.

Number and Rate* for Deaths by Leading Causes,
Sunshine Canyon Landfill Tract, Sylmar/Granada Hills Adjacent Census Tracts, and Los Angeles County, 1996-2001.

	Sunshine Canyon Landfill Tract**		Sylmar/Granada Hills Tracts***		Los Angeles County	
	Number	Rate*	Number	Rate*	Number	Rate*
All Causes	95	398	1,285	545	357,099	468
Leading Causes of Death:						
Heart Disease	32	133	502	238	117,778	160
Cancer	24	96	299	111	80,213	105
Stroke	10	36	72	25	25,253	24
Influenza & Pneumonia	7	NR	51	25	17,064	24
Diabetes	5	NR	46	18	10,735	14
Unintentional Injuries (Accidents)	4	NR	45	15	12,056	14
Emphysema and other chronic respiratory diseases	3	NR	59	25	17,157	34

* Per 10,000 persons, age-adjusted and cumulative over six years.

** 1990 & 2000 Census Tract: 1066.03.

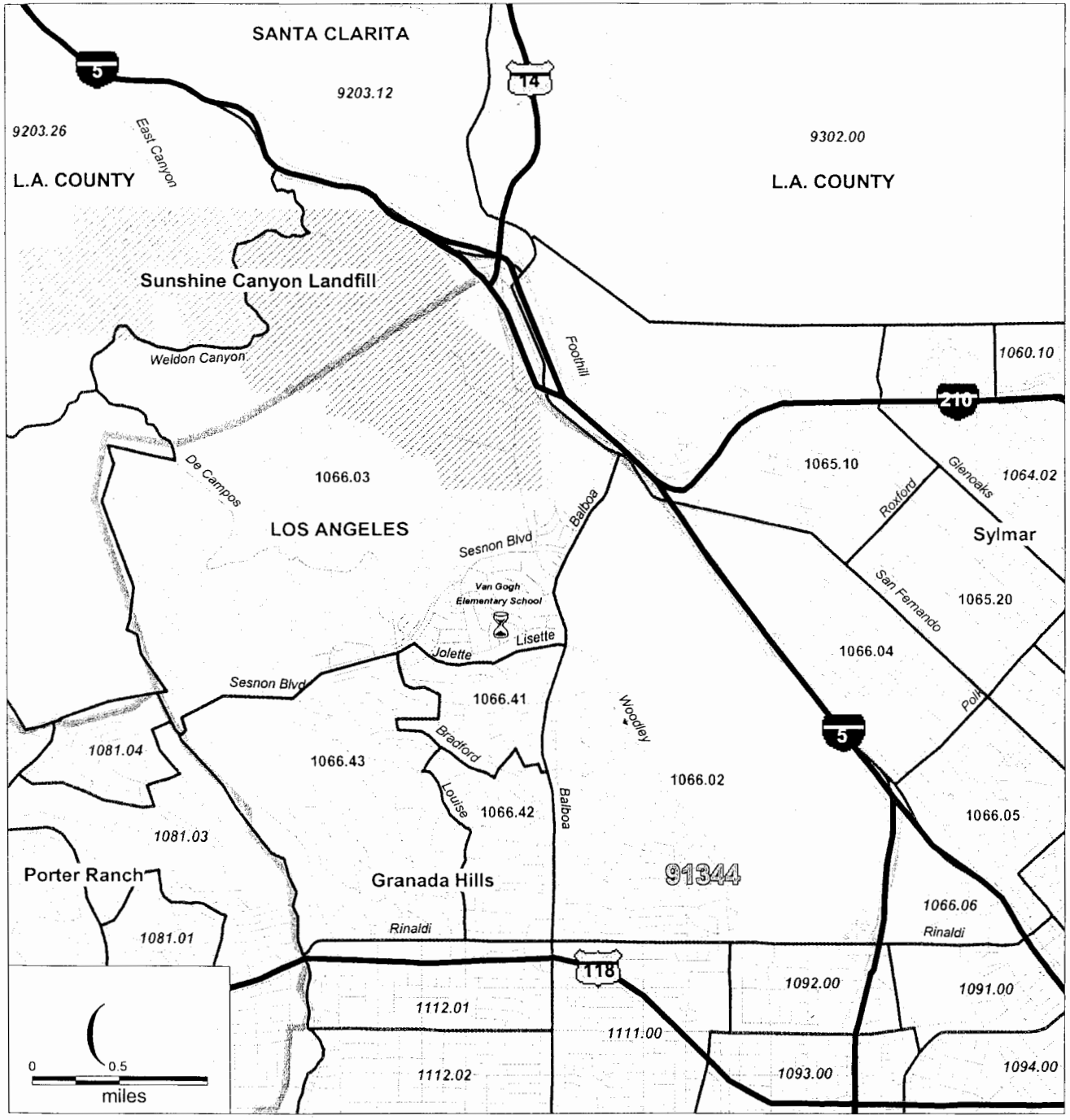
*** 1990 Census Tracts: 1065.00, 1066.01, 1066.02, 1066.41, 1066.42, 1066.43; 2000 Census Tracts: 1065.10, 1065.20, 1066.04, 1066.02, 1066.05, 1066.41, 1066.42, 1066.43.

NR: The number of observed deaths is too small (less than 10) to produce a reliable rate.

Source: Deaths: Linked Death Files 1996 to 2001, Los Angeles County Department of Health Services, Data Collection and Analysis Unit; Population: Summary File 1, Census 2000, U.S. Census Bureau.

Conclusion:

The results do not provide evidence of excess mortality or unusual patterns of mortality during the period 1996-2001 among persons living in close proximity to the Sunshine Canyon Landfill. These results should be interpreted with caution given the lack of information on the multitude of factors that could influence mortality.

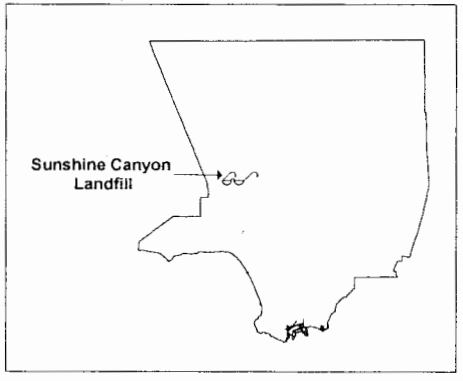


SUNSHINE CANYON LANDFILL

Census Tracts 2000
ZIP Codes 2001

LEGEND

- Landfill
- Census Tract
- ZIP Code
- City
- County
- Freeway
- Street
- Public School



Prepared by Los Angeles County DHS, Public Health,
Office of Health Assessment and Epidemiology, September 2003